Rec'd.

extends over the rim of said substrate and provides on said first surface a connecting pad via which said component is conductively connected to said second electrode. --

R E M A R K S

Applicants have considered the outstanding official action. It is respectfully submitted that the claims are directed to patentable subject matter and are in condition for allowance as set forth below.

Applicants note that the present application is a §371 filing of PCT/DE98/03300 and claims benefit of German Application Nos. 197 56 534.4 filed December 18, 1997 and 198 20 208.3 filed May 6, 1998. The priority documents were filed during the International phase as acknowledged in the Notification of Acceptance mailed August 2, 2000. Acknowledgment of the claims for priority is respectfully requested.

Further, applicants note that claims 5 and 6 have been canceled and the features thereof incorporated into amended claim 1 and new claim 10, respectively. More particularly, claim 1 has been amended to claim a capacitor connected in series and new claim 10 added to claim a capacitor connected in parallel. Additionally, claim 1 and claim 10 include the feature that temperature data from the component are transferred over a two-pole supply lead that

is used to supply the two electrodes. Support for the feature is found on page 4, lines 29-36. No new matter has been added.

Additionally, claims 1-4 and 7-8 have been amended and new claims 11 and 12 have been added (claims 11 and 12 being based on claims 3 and 4, respectively) to better conform with U.S. practice. No new matter has been added.

Claims 1 and 2 are rejected under 35 U.S.C. §102(b) as being anticipated by Long et al (U.S. Patent No. 5,041,800), Sekler et al (U.S. Patent No. 4,561,286) or Persson (U.S. Patent No. 3,818,254). Additionally, claims 3-6 are rejected under 35 U.S.C. §103(a) as being unpatentable over Long et al, Sekler et al or Persson. Applicants respectfully submit that Long et al, Sekler et al and Persson each fail to teach or suggest each and every feature of the claimed invention.

More particularly, Long et al teaches a circular crystal resonator 114 with electrodes 115 on both sides. A resistance heating element 102 is deposited on the surface of the resonator 114 and electrically connected through pins 107. The electrodes 115 are independently electrically connected through pins 108 (column 9, lines 11-15). The temperature of the crystal enclosure 104 is sensed by a temperature sensitive element 112 mounted either on an

insulating support ring 1222 (FIGURE 12B) or on the wall of the enclosure 104 (FIGURE 1A).

In contrast thereto, the temperature-sensitive component of the claimed invention is itself disposed on the electrode-free rim of the substrate such that temperature data from the component can be transmitted over a two-pole supply level that is used to supply the two electrodes. As illustrated at FIGURE 12B, Long et al does not teach mounting the temperature sensitive element directly on the body 114 of the resonator. Moreover, the temperature sensitive element 112 is not connected to at least one of the electrodes 115, but to the circuit for controlling the resistance heating element 102 (see, e.g. FIGURE 3). Thus, Long et al does not teach or suggest a piezoelectric transmitter as claimed by applicants.

Sekler et al teaches a piezoelectric contamination detector having a measuring crystal 1 with electrodes 15 on both sides of a reference crystal and an integrated temperature sensor 16 on one side (see Figures 1 and 2). However, similar to Long et al, Sekler et al does not teach or suggest a direct connection between the temperature sensor 16 and the electrodes 15.

Persson teaches an apparatus having a piezo-electric crystal 5 with a first electrode 15 on a front side and a second electrode 14 on a back side of the surface of

the crystal 5. A resistive sensor 12 is placed on the front side of the crystal interconnecting the second electrode 15 with a third electrode 16 and is established in parallel with a resistive heater 11. The apparatus has three terminals 21-23. Terminals 21 and 22 are connected to the electrodes 14 and 15, respectively, providing a crystal signal circuit. Terminals 22 and 23 provide a resistive heater circuit, wherein terminal 22 is common to the crystal signal circuit and the resistive heater circuit (column 3, lines 29-40). Thus, Persson teaches the requirement of three terminals to fulfill the intended function of the piezoelectric crystal and the temperature sensing.

In contrast thereto, the parallel or serial connection of the component to the capacitor formed by the two electrodes of the claimed invention permits temperature data to be transmitted directly via the two-pole leads for the electrodes. Thus, no additional leads for the temperature-dependent component are necessary as taught by Persson. This is a significant advantage in that the need for expensive and complicated cabling is obviated. None of the applied art teaches or suggests this construction.

Accordingly, Long et al, Sekler et al and Persson each do not teach each and every element of the claimed invention according to claims 1 and 2, and thus, do not anticipate the claimed invention under 35 U.S.C. §102(a).

Further, a prima facie case of obviousness under §103(a) has not been set forth as all limitations of the claimed invention are not taught or suggested by the applied art. In re Royko, 490 F.2d 981, 108 USPQ 580 (CCPA 1974). As set forth above, the claimed piezoelectric transmitter includes elements not taught or suggested by the applied patents, specifically, for example, a temperature-dependent component conductively connected to two electrodes, either in series or parallel, such that temperature data from the component are transmitted over a two-pole supply lead that is used to supply the two electrodes. Accordingly, withdrawal of the §102 and §103 rejections is requested.

In addition, the Examiner applies Ice (U.S. Patent No. 3,349,348), Newell et al (U.S. Patent No. 3,176,244) or Brenig (U.S. Patent No. 3,322,981) in combination with Long et al, Sekler et al or Persson to reject claims 7-9 under 35 U.S.C. §103(a). Claims 7-9 are dependent indirectly on independent claims 1 and 10. Applicants submit that none of Ice, Newell et al or Brenig, provide for the shortcomings of Long et al, Sekler et al and Persson as set forth above.

This is further evident from the application of Ice, Newell et al and Brenig by the Examiner as to added limitations only in the dependent claims.

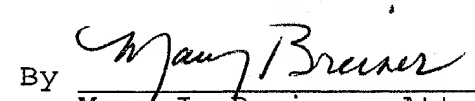
Applicants respectfully submit, therefore, that the claimed invention is further not rendered obvious within

the meaning of 35 U.S.C. §103 based on the combination of any of the primary references with any one of the secondary references. Withdrawal of the rejections is requested.

Reconsideration and allowance of the application is respectfully urged.

Respectfully submitted,

THOMAS HAHN ET AL

By 

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Attachments - Marked-Up Version Of Claims

MARKED-UP VERSION OF CLAIMS

1. (Amended) A piezoelectric transmitter [having] comprising a substrate [(1)] made of a piezoelectric material provided with a first electrode [(2)] on a first surface and a second electrode [(6)] on a second surface opposite said first surface, said first electrode and said second electrode forming a capacitor, [with on] said first surface having an electrode-free rim surface [(3) being provided,] on which is disposed a component [(9)] having temperature-dependent behavior [and conductively connected via a connection to at least one of said electrodes (2, 6)] and a low impedance in comparison to said substrate, wherein the capacitor is conductively connected in series to said component such that temperature data from said component are transmitted over a two-pole supply lead that is used to supply said first electrode and said second electrode.

2. (Amended) A piezoelectric transmitter according to claim 1 or 10, [characterized by] wherein said substrate [(1)] is made of [a piezoelectric material being] a piezoceramic.

3. (Amended) A piezoelectric transmitter according to claim 1 [or 2, characterized by], wherein said first electrode [(2) having a shape with] has a nose [(5)], which [forms] provides on said first surface a connecting pad via

which [the connection of] said component [(9)] is conductively connected to said first electrode [(2)].

4. (Amended) A piezoelectric transmitter according to [one of the claims 1 to 3, characterized by] claim 3, wherein said second electrode [(6) having a shape with] has a nose [(8)], which [runs around] extends over the rim of said substrate [(1)] and [forms] provides on said first surface a connecting pad via which [said connection or an additional connection of] said component [(9)] is conductively connected to said second electrode [(6)].

7. (Amended) A piezoelectric transmitter according to [one of the claims 1 to 6, characterized by] claim 3, 4, 11 or 12, wherein said component [(9) being] is a PTC resistor.

8. (Amended) A piezoelectric transmitter according to [one of the claims 1 to 6, characterized by] claim 3, 4, 11 or 12, wherein said component [(9) being] is a NTC resistor.

9. (Amended) A piezoelectric transmitter according to [one of the claims 1 to 8, characterized by] claim 3, 4, 11 or 12, wherein said component [(9) being] is built in the SMD manner.